



STEM IN LIFE SCIENCE

to Achieve Whole Person Development



The aspara[®] STEM Academy includes hardware, software, and courses, which promotes understanding of nature through STEM education in life science. It aims to unleash students' creative potential, cultivate their resilience to face challenges, instill correct values and attitudes, and equip them to tackle the economic and technological challenges of today's society, becoming the talents of the future.

We adopt a holistic approach to experiential learning by integrating life science elements into conventional STEM activities. This provides students with safe, practical, engaging, and diversified learning experiences. This interdisciplinary curriculum covers fields such

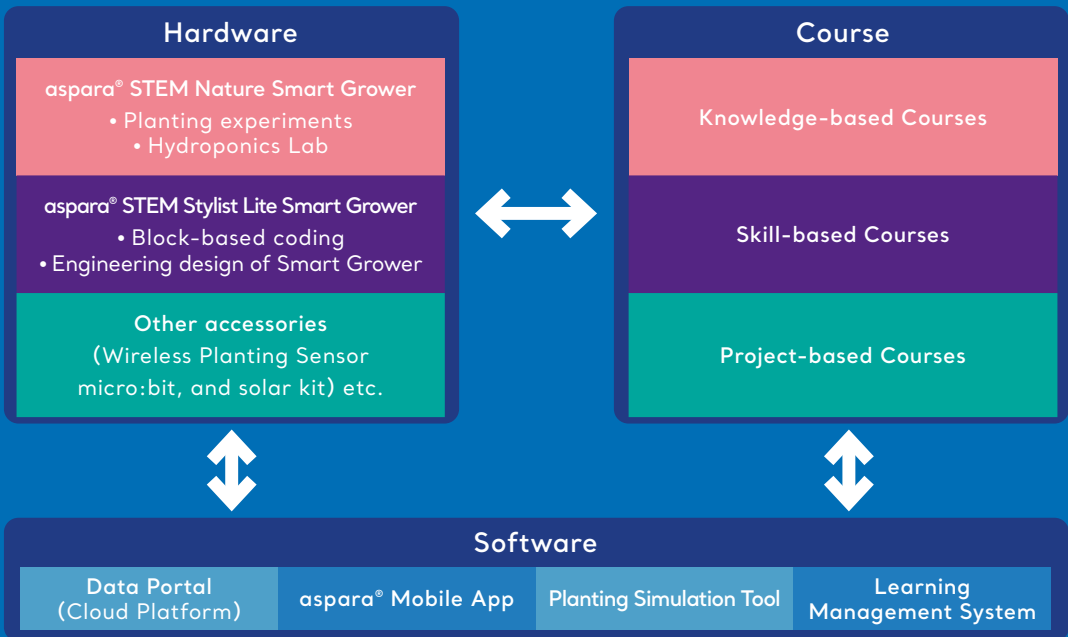
as physics, chemistry, biology, electronics, optics, mathematics, statistics, big data, and programming, enabling students to grasp and apply knowledge from different domains. It helps them explore future career paths such as doctors and nutritionists.

Through our indoor Smart Grower and STEM learning programs, we offer unique and diversified learning experiences to schools across Hong Kong and overseas. Key concepts include global warming and modern food production, plant life cycles, key factors influencing plant growth, and the science of photosynthesis. This strengthens the connection between daily life and science and technology while promoting a low-carbon lifestyle.

aspara[®] STEM Learning System (aspara[®] STEM Academy)



Received the STEM Q-Mark certification issued by the Hong Kong Q-Mark Council.



Course Overview

The curriculum we offer is based on the Hong Kong Education Bureau's Key Learning Areas (KLA) Curriculum Guide, with reference to the Computer Science Teachers Association (CSTA) and the United States' Next Generation Science Standards (NGSS). Our experienced education team is committed to creating and optimizing learning content. The courses are divided

into three major categories, namely **science knowledge-based courses**, **STEM skill-based courses** and **project-based courses**, allowing students to have a deep understanding of the relationship between living things and the natural environment. **Equip students with critical skills needed in the 21st century.**

Primary Schools (P4-P6)

Develop the basic STEM concepts, thinking & mindset

Simplicity & Foundations

More Visual Learning

Hands-on Learning

Contextual Learning
(Real-life examples and applications)

Secondary Schools (S1-S3)

Explore more complex STEM concepts, apply & integrate the concepts

Increased Complexity

Scientific Vocabulary

Inquiry-Based Learning

Integration with Other Topics



A STEM Laboratory in a secondary school

Some of Knowledge-based Courses are as follows:

Code	Topics	Description
Knowledge-based Courses for primary schools (P.4 to P.6)		
K1p	Global warming & modern food production	Climate change is having a profound effect on the world's food supply.
K2p	Life cycle of plant	
	• Seed	Students will learn about the different parts of a seed and how they contribute to plant growth and development.
	• Germination	Students will explore the process of germination and what plants need to successfully sprout from a seed.
K3p	Key factors affecting plant growth (i)	
	• Key factors	Students will explore the impact of plant food (nutrients), light, water, temperature, and other environmental conditions on plant development.
	• Plant food (nutrients)	Students will explore the different types of plant nutrients and their role in promoting healthy growth.
K4p	Key factors affecting plant growth (ii)	
	• Light and photosynthesis	Students will learn the science of photosynthesis, and importance of oxygen during photosynthesis
K5p	Low carbon living	Students will learn about the importance of renewable energy sources, and explore the concept of "Reduce, Reuse, and Recycle".
Knowledge-based Courses for secondary schools (F.1 to F.3)		
K1s	Food supply issues and modern food production	Students will learn about the challenges that farmers face unpredictable weather conditions and explore how hydroponic growing systems can help food production.
K2s	Life cycle of plant	
	• Seed	Students will learn more about the different parts of a seed and how they contribute to plant growth and development.
	• Germination	Students will explore more deeper the process of germination and what plants need to successfully sprout from a seed.
K3s	Key factors affecting plant grow (i)	
	• Key factors	Students will learn how to use data collection and analysis to optimize growing conditions for different types of plants using our smart hydroponic grower.
	• Plant food (nutrients)	Students will also learn how to identify nutrient deficiencies and ways to provide plants with the nutrients they need using hydroponic systems.
K4s	Key factors affecting plant grow (ii)	
	• Light and photosynthesis	With the help of smart hydroponic grower, we'll be able to observe and track photosynthesis in real-time with respect to different
K5s	Key factors affecting plant grow (iii)	
	• PH	Students will learn the specific pH requirements of the plants being cultivated is crucial for optimizing nutrient uptake and preventing nutrient deficiencies or toxicities.

For more information about STEM Skill-based Courses and Project-based Courses, please contact us at info@grow-green.com.

aspara® STEM Academy Package

Hardware:

1. aspara® Nature Smart Grower

With a total of 16 growing spaces and up to ten built-in sensors, it is a hydroponic greenhouse equipped with aspara® mobile app intelligent control. It can be connected to the cloud server through Wi-Fi to provide controllable options. Students can try a variety of different experiments on their own with the Experimental Seed Kit, which offers exciting and versatile possibilities.



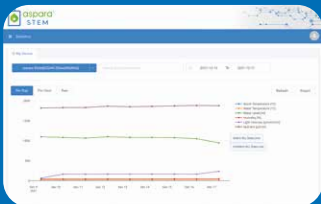
2. aspara® Stylist Lite Smart Grower

With a total of 8 growing spaces, it is a small hydroponic system that is lightweight and equipped with aspara® mobile app intelligent control. It can be connected to the cloud server through Bluetooth. Students can perform different programming (such as micro:bit) and use it to control the smart grower remotely. The process inspires creativity and stimulates thinking from multiple perspectives, students can learn to appreciate the scientific process and scientific spirit, and find different ways to solve problems.



3. Other Accessories:

Including Wireless Planting Sensor, micro:bit and solar panels, etc., which assist students in learning activities related to mathematics, statistics, big data, programming and other learning activities.



Software:

1. Data Portal (Cloud-based)

It is a web portal to control and set the environmental parameters of the Nature Smart Grower, while collecting big data 24/7, allowing students to download tracking data, record plant growth and analyze the results. Students can also be divided into groups and use the group management function to monitor multiple accounts and multiple smart growers to enhance collaboration among classmates.

2. aspara® Mobile App



3. Planting Simulation Tool

4. Learning Management System

In addition to the aspara® Mobile App, it also includes Planting Simulation Tool and Learning Management System, providing a full range of planting experience and management, to help students master planting knowledge and skills.



Keylearning is a wholly-owned subsidiary of Growgreen Limited. The education team has rich teaching experience and has developed a series of STEM teaching and life science learning materials, course content and teacher training packages, which emphasize both theory and practice to arouse students' interest. The solution helps local kindergartens, primary schools and secondary schools implement STEM education effectively.



TWGHs Chan King Har Kindergarten



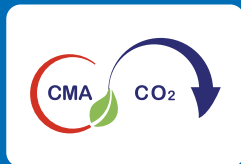
NTWJWA Christian Remembrance of Grace Primary School

aspara® STEM Academy is a learning system that meets the eligibility criteria for the Quality Education Fund (QEF) and Innovation and Technology Fund (ITF) applications in Hong Kong. Many schools have successfully obtained funding approval with this program, and this year, the learning system has also received the STEM Q-Mark certification issued by the Hong Kong Q-Mark Council. Upon completion of the program, students will be awarded certificates in recognition of their achievement.



Sha Tin Government Secondary School

International Patent and Awards



Growgreen Limited

Contact: info@grow-green.com
www.grow-green.com/STEM